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Background

The public health guidance for physical activity (PA) recommends at least 150 minutes of moderate intensity PA weekly for the general population and during pregnancy.¹ In Northern Ireland, it has been estimated that approximately 51% of non-pregnant females meet these guidelines.² Despite the established benefits for mother and baby, levels of PA have been found to fall during pregnancy.^{3,4}

The COVID-19 pandemic has had far-reaching consequences for all areas of society and has significant impacts for pregnant women. A recent review indicates that pregnant women with pre-existing comorbidities, high maternal age, and high body mass index who contract COVID-19 may be more likely to be admitted to an intensive care unit and preterm birth rates are higher in pregnant women with COVID-19 than in pregnant women without the virus.⁵ Pregnant women have also experienced changes in their maternity care, with a reduction in face-to-face appointments and restrictions on who can attend appointments with them.

Women diagnosed with Gestational Diabetes Mellitus (GDM) are likely to have been further impacted with changing care pathways and testing procedures. GDM is a glucose intolerance with onset or first diagnosis during pregnancy.⁶ There is evidence to suggest the need for medication for women with GDM may be reduced through PA and PA can improve blood glucose control.^{7,8} Current National Institute for Health and Care Excellence (NICE) guidelines recommend women diagnosed with GDM are told that possible treatment includes changes in diet, exercise and medication.⁹ Therefore, PA is particularly important for this group of women.

PA levels of the general population are known to have been impacted by COVID-19: for some lockdown has been positive with an increase in time for PA, for others working from home may have increased sedentary behaviour and reduced incidental PA associated with personal transport and general movement throughout the working day.¹⁰ The PA levels of pregnant women are also likely to have been affected, with frequently reported activities in pregnancy such as swimming, pregnancy yoga and Pilates not being possible during lockdown.¹¹

This research aimed to investigate the impact the COVID-19 pandemic had on the PA and sedentary behaviour levels of women with GDM in the UK.

Approach

A UK wide, online survey investigating the PA and sedentary behaviour levels of pregnant women diagnosed with GDM during COVID-19 was circulated through social media channels. Women who had been pregnant during the COVID-19 pandemic and had been diagnosed with GDM; were resident in the UK; were 18 years old or over and could understand written English were invited to participate. The questionnaire included: demographics, individual circumstances (eg living arrangements, access to

space for PA), health and pregnancy, activity levels, sedentary behaviour, worry scores using the Brief Measure of Worry Severity Scale and level of agreement with COM-B statements relating to Capability (I had the ability to be physically active), Opportunity (I had the opportunity to be physically active) and Motivation (It was important to be physically active, I found exercise enjoyable and satisfying, I felt guilty when I don't exercise) both before COVID-19 and during COVID-19.¹²⁻¹⁵

Ethical approval was granted by the Ulster University Nursing and Health Research Ethics Filter Committee on 3 July 2020.

Findings

- 553 responses to the survey.
- Mean age of women was 32 years (SD 4.7), 93% were white, 59% had an undergraduate degree or higher and 62% were multiparous.
- 13% of women were in their first trimester, 57% in their second trimester and 30% in their third trimester.
- 47% of women were meeting the PA guidelines pre-COVID-19.
- 23% met the PA guidelines during COVID-19.
- Women in their first and third trimesters were less likely to meet the PA guidelines during COVID-19 than women in their second trimester (T1 13.1%, T2 28.2%, T3 18.2%, $P=.008$).
- 60% of women reported decreased activity levels during COVID-19, 21% reported no change and 19% reported increased levels.
- The most frequently cited reason for a decline in PA was fear of leaving the house due to COVID-19 (69%).
- Level of education, having fitness equipment at home and knowledge of how to exercise safely in pregnancy were all positively associated with PA levels during COVID-19.
- Women who reported they knew how to exercise safely in pregnancy were 1.8 times (OR 1.80, 95% CI 1.07, 3.02) more likely than those who did not know how to exercise safely in pregnancy to meet the PA guidelines during COVID-19 when controlling for level of education, fitness equipment ownership, space to exercise, key worker status, other children, maternity leave, employment status and working from home.
- 76% of respondents agreed/strongly agreed they would take part in an online exercise class if it was available.
- 92% of the women agreed/strongly agreed it would be useful to receive information on the PA guidelines in pregnancy.
- 79% of the women had increased sedentary time during COVID-19.
- The percentage of women agreeing/strongly agreeing they had the ability to be physically active dropped from 87% before COVID-19 to 59% during COVID-19.
- Reported opportunities to be physically active decreased from 88% before COVID-19 to 51% during COVID-19.
- The mean worry score for the women was 12.15 (SD 6.65, range 0-24), 45% of the women had worry scores classified on the scale as 'dysfunctional' (A score of 12 or above).
- Women with higher worry scores (over 12) were significantly less likely to meet the PA guidelines during COVID-19 than those with lower worry scores (OR 0.58, 95% CI 0.37, 0.92). However, there was no statistically significant association between worry scores and fear of leaving the house.

Figure 1: Percentage of women meeting the PA guidelines before COVID-19 and during COVID-19 by country.

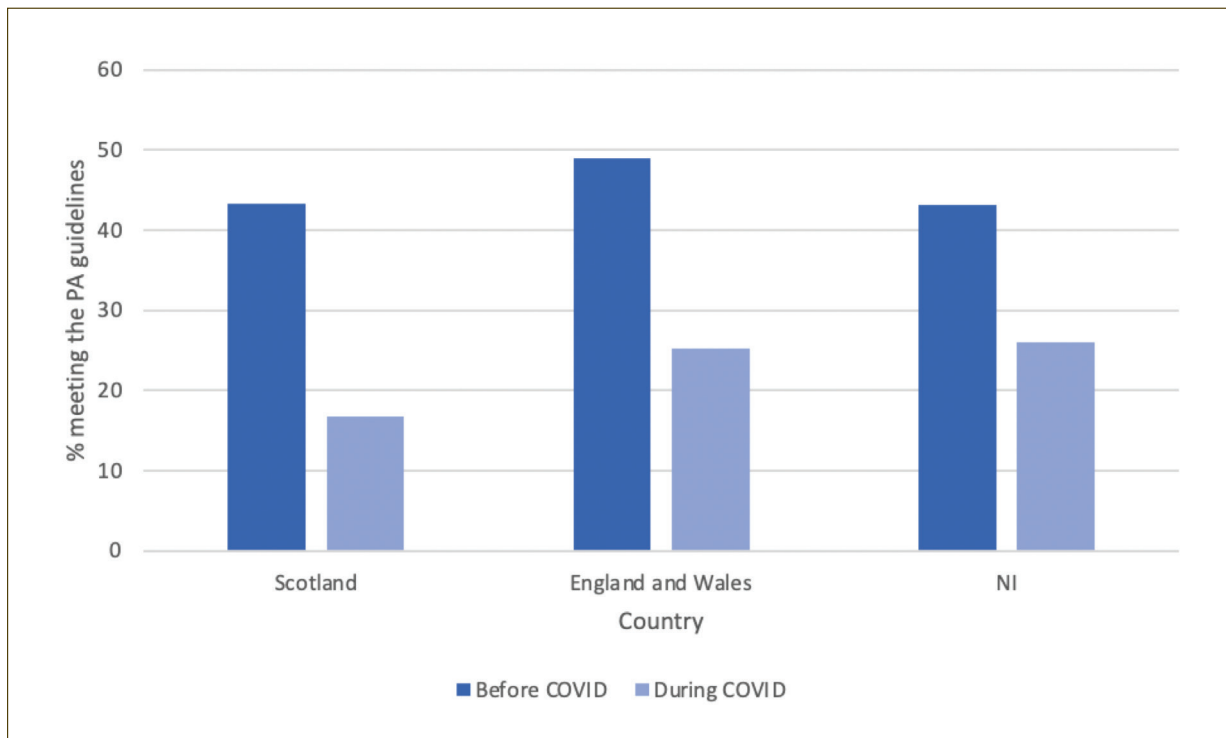
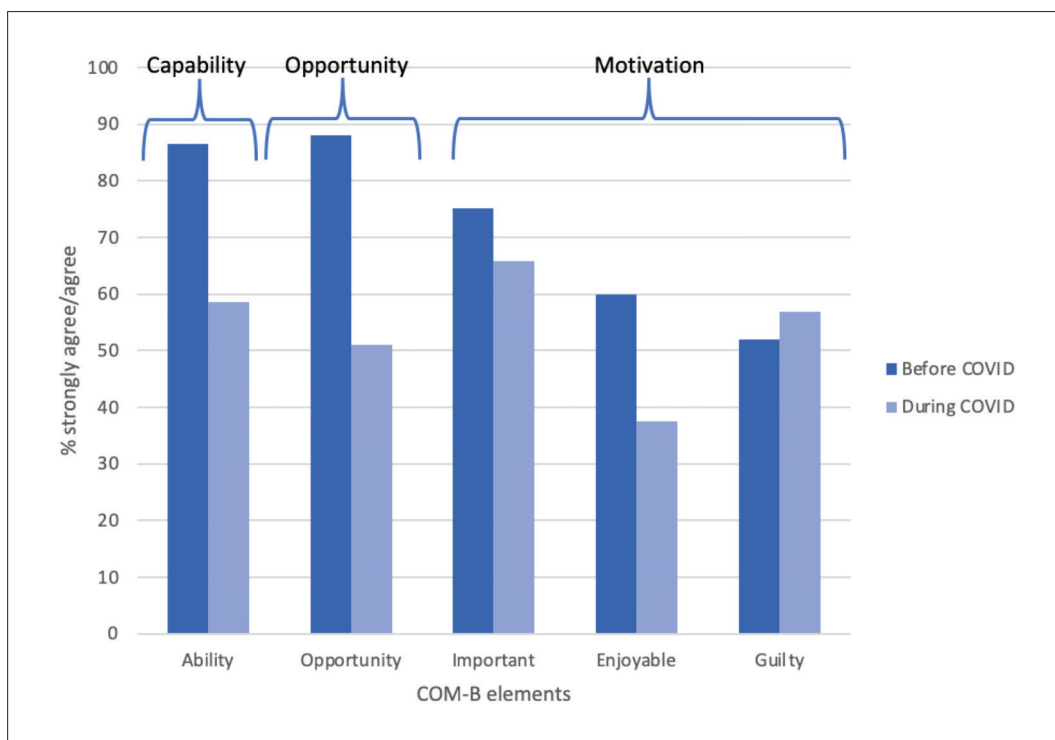


Figure 2: Agreement with COM-B statements before COVID-19 and during COVID-19.



Implications for practice and policy

The findings highlight the need for focused interventions to address the decreased levels of PA and increased sedentary time for women with GDM as a result of the COVID-19 pandemic. The percentage of women meeting the PA guidelines during the COVID-19 pandemic dropped by 50%, with 69% of women who reported decreased PA levels during COVID-19 attributing the decline to fear of leaving the house due to COVID-19. Alternative PA options such as online exercise classes which can be completed in the women's own home need to be made available for this group of women, thus removing the barrier of fear of leaving the house.

Women who reported knowledge of how to exercise safely in pregnancy were 1.8 times more likely than those who did not have this knowledge to meet the PA guidelines during COVID-19. This highlights the importance of women receiving appropriate information on not only the PA guidelines for pregnancy but also examples of suitable and safe exercise they can carry out during pregnancy. While women in Northern Ireland are given 'The Pregnancy book' at their initial appointment which contains information on the PA guidelines, exercise tips, exercise to stop in pregnancy and stretching exercises, more information is required on types of appropriate exercise.¹⁶ For example, a bodyweight exercise circuit which could be carried out at home with little or no equipment would be helpful.

The results of this study show the decline in both women's perceived abilities and opportunities for PA during COVID-19. As the COVID-19 pandemic is likely to remain for some time and face-to-face group exercise classes have been suspended twice to date in Northern Ireland, considerable thought needs to be given to increasing the PA opportunities for this group of women within the current restrictions.

The high level of worry experienced by this group of women is also cause for concern. Antenatal anxiety scores are associated with a greater risk of postnatal depression and women diagnosed with GDM are already at greater risk from postnatal depression.^{17,18} Evidence suggests physical activity in pregnancy can reduce the risk of both antenatal depression and postnatal depressive symptoms.^{19,20}

Conclusion

Action needs to be taken to reduce the decline in PA seen by the women in this study. PA in pregnancy with GDM has been found to have a number of positive benefits. A systematic literature review found that women who exercised were 47% less likely to need insulin compared to those in the control groups (OR 0.53, 95% CI 0.29, 0.97, $P=0.04$).⁷ It has also been found that women who use insulin during pregnancy are at higher risk for large for gestational age (LGA) infants (28.5% vs 13.1%, $p<0.001$) and caesarean sections (44.1% Vs 27.0%, $p=0.001$).²¹ PA has also been associated with lower birth weights and there is a lower risk of macrosomia in newborns of mothers who exercised during pregnancy.^{22,23}

Women need to be fully informed that PA in pregnancy is not only safe but also beneficial. They need to be shown ways to be active from their own home and encouraged to remain active. Providing women with suitable examples of exercise routines and access to online exercise classes delivered by an instructor qualified in prenatal exercise are possible solutions to reduce the decline in PA during the COVID-19 pandemic and associated lockdown periods.

Recommendations are provided for policy makers, midwives and health service providers to assist them in understanding how best to support pregnant women with GDM through a second wave of COVID-19 or future lockdowns.

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